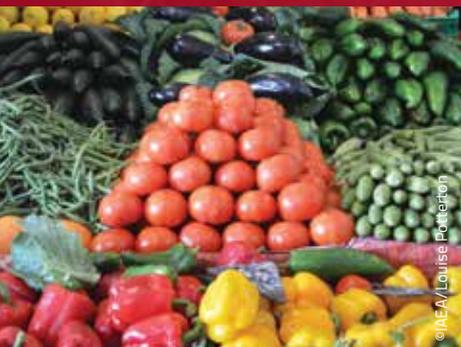




Joint FAO/IAEA Programme
Nuclear Techniques in Food and Agriculture

Addressing food safety and quality with nuclear techniques



Food safety and quality are a global concern, especially in addressing food security. The Joint Food and Agriculture Organization of the United Nations (FAO)/International Atomic Energy Agency (IAEA) Division conducts research and supports capacity building on nuclear and isotopic techniques to support food safety/quality control systems. A significant constraint among many countries is limited laboratory capability and lack of reliable and cost effective analytical methods meeting national/international standards and guidelines.

What FAO does

Nuclear and isotopic analytical techniques add great value to testing programmes by improving method robustness and precision, facilitating the rapid testing of several food samples for multiple contaminants and verifying integrity.

- Research, transfer and application of laboratory radiometric and complementary analytical techniques for single and multiple food contaminants, including veterinary drug and pesticide residues, mycotoxins, toxic metals, etc.;
- Trains and provides technical advice to food and environmental safety laboratory personnel and national programmes for testing and monitoring food contaminants and residues. About 200 laboratory personnel are trained annually at the FAO/IAEA laboratories and at training programmes in member countries;
- Conducts research and training on food forensics, traceability and authenticity and transfers developed methods to member countries;
- Conducts research and training on optimization of sample preparation using radioisotopes; radioisotopes for metabolic/transfer studies; and stable isotope measurements (e.g. H, C, N, O, S, B, Sr) to provide information on the geographical origin of food products;
- Assists member countries in applying Codex standards by developing, maintaining and updating the *Food Contaminant and Residue Information System* database, and disseminating analytical methods to support national residue monitoring programmes;
- Assists in development of methods and procedures to establish the authenticity of food products or identify adulteration;
- Provides technical/scientific support for international standards setting and risk management regarding chemical/natural food hazards;
- Assists member countries through more than 40 national, regional and interregional technical cooperation projects and promotes networking.

Contributes to FAO's Strategic Objectives 2, 4 and 5



Make agriculture, forestry and fisheries more productive and sustainable
Enable inclusive and efficient agricultural and food systems
Increase the resilience of livelihoods to threats and crises

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Understanding the context

Food safety impacts global health, trade and economic development, and with the globalization of trade, food safety and quality in one country has ramifications elsewhere. Food fraud costs the food industry US\$10 billion to \$15 billion a year, affecting approximately 10% of all commercially sold products. The impact could be greater if food safety or public health risks occur.

As many member countries strive to meet local consumer demands and stringent import requirements amid stiff competition on the international food markets, the demand for support to set up or improve national food safety/quality control systems has equally grown each year. In response to these demands, the Joint Division's R&D on nuclear/isotopic techniques and capacity building programmes have helped initiate or strengthen effective national residue/contaminant monitoring programmes in over 50 countries.

The Joint Division assisted Pakistan's National Institute for Agriculture and Biology build institutional capacity, resulting in the first veterinary drug residue testing programme in the country. This is expected to improve the country's food exports with provision of reliable



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analytical services. Similarly in Angola and Mozambique the first residue/contaminant testing laboratories were set up at the Veterinary Research Institute and Agricultural Research Institute, respectively.

Outsourcing analytical tests due to limited laboratory capabilities is a major challenge to many countries relying on food exports, such as Chile (US \$15.2 billion exports in 2013) and Botswana (a top African beef exporter). Institutional capacity has been built in both countries, reducing the dependence on the costly outsourcing. In Botswana a residue testing laboratory is fully functional and capacity to operate state-of-the-art instrumentation has increased by 80%. A 52% increase in the availability of in-house fit-for-purpose analytical methods was registered at this laboratory following the development/validation of 14 analytical methods, 13 of which have been accredited. Capacity to train other laboratory personnel in respective regions has been enhanced and this benefits a network of testing laboratories. Networks of approximately 40 laboratories in Latin America and 30 food safety institutions in Africa have been established as avenues for member countries to share technical knowledge and experiences for better food safety/quality.



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MORE INFORMATION

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